

CLAIMS

What is claimed is:

1. An underwater diving mask for use by a diver in an underwater diving environment, the diving mask comprising:
 - a viewing portion defined by the diver's face and a lens;
 - a visual display device proximate the viewing portion to provide visual images to the diver;
 - a speaking chamber configured to sealingly engage a portion of the diver's mouth to permit the diver to speak;
 - a sound transducer located proximal the speaking chamber;
 - a computer system disposed in a portion of the mask and operatively coupled to the sound transducer and to the visual display device;
 - the computer system, the viewing portion and the speaking chamber sealingly isolated from the underwater diving environment; and
 - the computer system receiving electrical signals produced by the sound transducer and configured to recognize and identify the electrical signals as spoken words of the diver, the identified spoken words providing input to the computer; to direct the computer system to provide visual images to the visual display in response thereto to facilitate hands-free operation of the diver.
2. The diving mask of claim 1 wherein the computer system is operatively coupled to the display device such that no wiring or tether external to the diving mask is required.
3. The diving mask of claim 1 wherein the display device is operatively coupled to the computer system by short length of cabling so that no external cabling extends from the diving mask in a region defined by the diver's head portion to a part of the diver located away from the diver's head.
4. The diving mask of claim 1 wherein
 - the sound transducer is selected from the group consisting of a microphone, crystal microphone, piezoelectric transducer, throat/larynx transducer and vibration transducer;
 - the computer system is selected from the group consisting of a computer, microprocessor, RISC processor, single-chip computer, single-board computer, controller, micro-controller and discrete logic computer; and

the display device is selected from the group consisting of a liquid crystal display, LED display, electro-fluorescence display, gas plasma display, prism-type optic display, prismatic projection system and cathode ray tube.

5. The diving mask of claim 1 further including non-volatile storage operatively coupled to the computer system, the non-volatile storage is selected from the group consisting of a ROM, PROM, EPROM, flash memory, optical memory, static memory, bubble memory, memory sticks and hard disk memory.

6. The diving mask of claim 1 wherein the computer system further includes a speech recognition portion configured to receive and process the electrical signals from the sound transducer, and recognize and identify the electrical signals as the spoken words from the diver, and to provide input to the computer system corresponding to the spoken words.

7. The diving mask of claim 1 further including a speech recognition processor operatively coupled to the sound transducer to receive the electrical signals therefrom, and operatively coupled to the computer system, the speech recognition processor configured to recognize and identify the electrical signals as the spoken words from the diver and to provide input to the computer system corresponding to the spoken words.

8. The diving mask of claim 1 wherein the computer system provides a plurality of predetermined functions displayed on the display device, the computer system performing at least one of the predetermined functions in response to the input representative of the spoken words of the diver.

9. The diving mask of claim 1 wherein the computer system provides one or more menus to the display device, each menu containing one or more predetermined functions executable by the computer system.

10. The diving mask of claim 9 wherein the plurality of menus include a hierarchical set of menus.

11. The diving mask of claim 8 wherein the predetermined functions are selected from the group consisting of a menu, pull-down menus, digital camera control applications, life support applications, general purpose applications, gyroscopic/inertial sensor applications, transmitter and receiver applications and power management applications.

12. The diving mask of claim 11 further including a gyroscopic/inertial sensor operatively coupled to the computer system.

13. The diving mask of claim 1 further including

a receiver system operatively coupled to the computer system and configured to receive incoming data from the underwater diving environment;

a transmitter system operatively coupled to the computer system and configured to transmit data to the underwater diving environment; and

the receiver system and transmitter system located proximal the diving mask and sealing isolated from the underwater diving environment.

14. The diving mask of claim 13 wherein the data is selected from the group consisting of speech data, digital data, numerical data and graphical data.

15. An underwater diving mask for use by a diver in an underwater diving environment, the diving mask comprising:

a viewing portion defined by the diver's face and a lens;

a display means for providing visual images to the diver;

a speaking chamber configured to sealing engage a portion of the diver's mouth to permit the diver to speak;

a sound transducer located proximal the speaking chamber;

a computer system disposed in a portion of the mask and operatively coupled to the sound transducer and to the display means;

the computer system, the viewing portion and the speaking chamber sealing isolated from the underwater diving environment;

voice recognition means for recognizing and identifying spoken words of the diver; and

the identified spoken words provided to the computer system as input thereto to direct the computer system to provide visual images to the display means in response thereto to facilitate hands-free operation of the diver.

16. The diving mask of claim 15 wherein the voice recognition means is operatively associated with the computer system and is configured to receive the electrical signals from the sound transducer, the voice recognition means configured to recognize and identify the electrical signals as the spoken words from the diver and to provide input to the computer system corresponding to the spoken words.

17. The diving mask of claim 1 wherein the voice recognition means further includes a voice recognition processor operatively coupled to the computer system and coupled to the sound transducer to receive the electrical signals therefrom, the speech recognition processor configured to recognize and identify the electrical signals as the spoken

words from the diver and to provide input to the computer system corresponding to the spoken words.

18. A method of controlling a computer in an underwater diving environment to facilitate hands-free operation of the diver, the method comprising the steps of:

- providing the diver with a diving mask having a viewing portion defined by the diver's face and a lens;

- placing a visual display device proximate the viewing portion to provide visual images to the diver;

- incorporating a sound transducer within a speaking chamber, the speaking chamber configured to sealingly engage a portion of the diver's mouth to permit the diver to speak;

- operatively coupling a computer system with the sound transducer and the visual display device;

- sealingly isolating the computer system, the viewing portion, and the speaking chamber from the underwater diving environment;

- speaking into a sound transducer located proximal the speaking chamber to produce electrical signals;

- receiving and processing the electrical signals by the computer system, the computer system recognizing and identifying the electrical signals as spoken words of the diver, the identified spoken words providing input to the computer; and

- directing the computer system to provide visual images to the visual display in response to the identified spoken words to facilitate hands-free operation of the diver.